

Learning Mathematics Through Mastery of Concepts

Is there a better way to **learn mathematics** as one progresses to higher level of education?

There are many ways to learn a subject. Different people has different learning style. However, regardless of learning style, there are two particular ways to learn knowledge within any style. The first way is memory method. This way of learning focuses on remembering facts and details, and recalling them when required. The second method is to understand the underlying concepts of the facts. It is the "what" versus the "how" and "why". Either way has their merits and demerits. It depends on the education level and complexity of the subject matters. Sometimes, a hybrid of both are necessary to reap the best possible results, especially in learning mathematics.

For elementary mathematics level, the amount of mathematical facts and concepts to be learned are marginal, and only serves to lay foundation for further advancement into higher mathematics learning. At the basic level, memory method of learning may be acceptable and manageable. But how about maintaining this way when one progresses into higher mathematics studies?

At a higher level of mathematics learning, the learning taxonomy moves into the application level and beyond. **Mastery of concepts** becomes an important factor in analyzing and solving more complex mathematics questions. Mathematical equations and expressions get more integrated with detailed concepts. Pure memory will not be able to extract out the true meaning of these equations and expressions. A few mathematical tools may be required to solve a mathematics problem. This combination of solving methods and concepts rendered pure memory way of learning mathematics unacceptable. The scope to cover all possible combinations of solving tools and questions is far too wide to manage. Staying firm with this facts-remembering method will only cause the performance and outcome to dwindle low. This will reduce the motivation to study and may decline towards the fearful mathematics anxiety situation.

Studying mathematics is different from other subjects in that a unique language is used to present mathematical meaning. Symbols and variables are used to form relationships and conditions. Many in-depth concepts are embedded into these few symbols and variables, including mathematical operators. True mastery of the mathematics concepts is therefore needed. However, it should not be said that memorising facts are completely useless at the higher level of mathematics education. It still serves its purpose in that they are the basic ingredients for the brain to link up with the solving methods and conceptual approach. It is these linkages or bondings that retain and strengthen the acquired knowledge longer. This is real mastery of the subject and its topics. A hybrid of both learning methods is therefore necessary to achieve a level of acceptable comprehension with more emphasis going towards mastery of concepts.

In conclusion, time causes facts to fade off. Memorising facts will therefore not last long. A better learning platform is to focus on relationship and concept mastery. Linking facts

to solving strategy becomes a useful problem-solving skill and has the benefit that it will last longer. Understanding the "why" and "how" is better when they complement the "what". Resistance to studying advance mathematics will then be lowered when the correct method of **learning mathematics through mastery of concepts** is applied.

About the Author: Lim EeHai has strong interest in mathematics and has created a mathematics site www.limeehai.com entitled Principle of Mathematics with the purpose that it can serves the needs of people involved with mathematics.